

ANALYTICAL BIOCHEMISTRY

Methods in the Biological Sciences

Volume 266, 1999

EDITOR-IN-CHIEF

William B. Jakoby

EXECUTIVE EDITORS

Assistant to the Editor-in-Chief, William S. Allison

Shelby L. Berger

Owen W. Griffith

Maria C. Linder

Ludwig Brand

Ueli Gubler

Irving Listowsky

George M. Carman

John A. Hanover

Walter M. Lovenberg

Catherine E. Costello

Carlos B. Hirschberg

Peter McPhie

Prescott Deininger

Robert Ivarie

Richard N. Perham

Jack E. Dixon

Barry L. Karger

B. David Stollar

Howard Goldfine

Y. C. Lee

M. H. V. Van Regenmortel

William D. McElroy

EDITOR EMERITUS

Alvin Nason, Founding Editor, 1960–1977

Nathan O. Kaplan and William D. McElroy, Editorial Committee Co-Chairmen, 1978–1986



ACADEMIC PRESS

Copyright © 1999 by Academic Press
All Rights Reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the Publisher. *Exceptions:* It is the policy of Academic Press that authors need not obtain permission in the following cases only: (1) to use their original figures or tables in their future works; (2) to make copies of their papers for use in their classroom teaching; and (3) to include their papers as part of their dissertations.

The appearance of the code at the bottom of the first page of an article in this journal indicates the Publisher's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (222 Rosewood Drive, Danvers, Massachusetts 01923), for copying beyond that permitted by Sections 107 or 108 of the U. S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1999 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0003-2697/99 \$30.00

MADE IN THE UNITED STATES OF AMERICA

This journal is printed on acid-free paper.



CONTENTS OF VOLUME 266

NUMBER 1, JANUARY 1, 1999

Enhancement of Cyanogen Bromide Cleavage Yields for Methionyl-Serine and Methionyl-Threonine Peptide Bonds	<i>Raymond Kaiser and Lorraine Metzka</i>	1
BirA Enzyme: Production and Application in the Study of Membrane Receptor—Ligand Interactions by Site-Specific Biotinylation	<i>Christopher A. O'Callaghan, Michael F. Byford, Jessica R. Wyer, Benjamin E. Willcox, Bent K. Jakobsen, Andrew J. McMichael, and John I. Bell</i>	9
A Dilatancy Assay for Nucleoid Denaturation: The Centrifugation-Dependent Clumping of Denatured Spermidine Nucleoids	<i>Lizabeth D. Murphy and Steven B. Zimmerman</i>	16
Immobilization of Oligonucleotides onto a Glass Support via Disulfide Bonds: A Method for Preparation of DNA Microarrays	<i>Yu-Hui Rogers, Ping Jiang-Baucom, Zhi-Jian Huang, Valery Bogdanov, Stephen Anderson, and Michael T. Boyce-Jacino</i>	23
Sample Preparation for Peptide Mapping—A Pharmaceutical Quality-Control Perspective	<i>Niklas Lundell and Thomas Schreitmüller</i>	31
Determination of Protein Carbonyl Groups by Immunoblotting	<i>C. E. Robinson, A. Keshavarzian, D. S. Pasco, T. O. Frommel, D. H. Winship, and E. W. Holmes</i>	48
¹³ C-Isotopic Enrichment of Glutathione in Cell Extracts Determined by Nuclear Magnetic Resonance Spectroscopy	<i>Michael P. Gamcsik</i>	58
Quantifying Amyloid β -Peptide ($A\beta$) Aggregation Using the Congo Red- $A\beta$ (CR- $A\beta$) Spectrophotometric Assay	<i>William E. Klunk, Robert F. Jacob, and R. Preston Mason</i>	66
Simultaneous Determination by Capillary Gas Chromatography of Organic Acids, Sugars, and Sugar Alcohols in Plant Tissue Extracts as Their Trimethylsilyl Derivatives	<i>Mark A. Adams, ZuLiang Chen, Peter Landman, and Timothy D. Colmer</i>	77
Radioactivity-Based and Spectrophotometric Assays for Isoorotate Decarboxylase: Identification of the Thymidine Salvage Pathway in Lower Eukaryotes	<i>Jeffrey A. Smiley, Julie M. Angelot, Renita C. Cannon, Eva M. Marshall, and David K. Asch</i>	85
Capillary Electrophoresis of RNA Oligonucleotides: Catalytic Activity of a Hammerhead Ribozyme	<i>Jan Saevels, Ann Van Schepdael, and Jos Hoogmartens</i>	93
Fluorescent-Assisted Detection of Oligosialyl Units in Glycoconjugates	<i>Chihiro Sato, Sadako Inoue, Tsukasa Matsuda, and Ken Kitajima</i>	102
Detection of Genomic DNA Fragmentation during Apoptosis (DNA Ladder) and the Simultaneous Isolation of RNA from Low Cell Numbers	<i>Peter T. Daniel, Isrid Sturm, Silke Ritschel, Katrin Friedrich, Bernd Dörken, Peter Bendzko, and Timo Hillebrand</i>	110
Determination of Low-Molecular-Weight Heparins and Their Binding to Protamine and a Protamine Analog Using Polyion-Sensitive Membrane Electrodes	<i>Narayanan Ramamurthy, Narayan Baliga, Thomas W. Wakefield, Philip C. Andrews, Victor C. Yang, and Mark E. Meyerhoff</i>	116
Characterization of Cholyl-Adenylate in Rat Liver Microsomes by Liquid Chromatography/Electrospray Ionization—Mass Spectrometry	<i>Shigeo Ikegawa, Hiroshi Ishikawa, Hiroyuki Oiwa, Masanori Nagata, Junichi Goto, Teruya Kozaki, Masaharu Gotowda, and Naoaki Asakawa</i>	125
Microassay of 5'-Nucleotidase and Adenosine Deaminase Activity in Microdissected Nephron Segments	<i>Feng Wu, Pin-Lan Li, and Ai-Ping Zou</i>	133
High-Throughput Screening for Ligand-Induced c-fos mRNA Expression by Branched DNA Assay in Chinese Hamster Ovary Cells	<i>Venkatakrishna Shyamala, Hamiduddin Khoja, Mary L. Anderson, Jian-xin Wang, Hui Cen, and W. Michael Kavanaugh</i>	140
A Continuous Fluorescence Assay for Tryptophan Hydroxylase	<i>Graham R. Moran and Paul F. Fitzpatrick</i>	148

- Covalent Immobilization of Recombinant Human $\alpha_v\beta_3$ Integrin on a Solid Support with Retention of Functionality Zvi Greenberg, S. Aubrey Stoch, Kathy Traianedes, Henry Teng, Michael Rosenblatt, and Michael Chorev 153

BOOK REVIEWS

- New Beer in an Old Bottle: Eduard Buchner and the Growth of Biochemical Knowledge.* Edited by Athel Cornish-Bowden. Reviewed by William B. Jakoby 165
- Chitin Handbook.* Edited by R. A. A. Muzzarelli and M. G. Peter. Reviewed by Enrico Cabib 165
- Briefly Noted. *Molecular Biomethods Handbook.* Edited by Ralph Repley and John M. Walker. 166
- Briefly Noted. *Introduction to Medicinal Chemistry. How Drugs Act and Why.* Alex Gringauz. 166

NUMBER 2, JANUARY 15, 1999

- Highly Efficient Green Fluorescent Protein-Based Kinase Substrates Feng Yang, Yi Liu, Sarah D. Bixby, Judah D. Friedman, and Kevan M. Shokat 167
- Cell Ashing for Trace Element Analysis: A New Approach Based on Ultraviolet/Ozone
Gelsomina De Stasio, B. Gilbert, L. Perfetti, R. Hansen, D. Mercanti, M. T. Ciotti, R. Andres, V. E. White, P. Perfetti, and G. Margaritondo 174
- The Inherent Quantitative Capacity of the Reverse Transcription-Polymerase Chain Reaction
William P. Halford, Viviana C. Falco, Bryan M. Gebhardt, and Daniel J. J. Carr 181
- A High-Throughput Radiometric Assay for Hepatitis C Virus NS3 Protease Mauro Cerretani, Laura Di Renzo, Sergio Serafini, Alessandra Vitelli, Nadia Gennari, Elisabetta Bianchi, Antonello Pessi, Andrea Urbani, Stefano Colloca, Raffaele De Francesco, Christian Steinkühler, and Sergio Altamura 192
- A Two-Dimensional Peptide Gel Electrophoresis System for Phosphopeptide Mapping and Amino Acid Sequencing Andrea Gatti and Jolinda A. Traugh 198
- Identification of Low-Molecular-Weight Compounds in Goat Epididymis Using Multinuclear Nuclear Magnetic Resonance Anant B. Patel, Sudha Srivastava, Ratna S. Phadke, and Girjesh Govil 205
- Determination of Doxorubicin and Doxorubicinol in Plasma of Cancer Patients by High-Performance Liquid Chromatography Peter de Bruijn, Jaap Verweij, Walter J. Loos, Herman J. Kolker, André S. T. Planting, Kees Nooter, Gerrit Stoter, and Alex Sparreboom 216
- Free and Total Malondialdehyde Assessment in Biological Matrices by Gas Chromatography–Mass Spectrometry: What Is Needed for an Accurate Detection Giuliana Cighetti, Sandra Debiassi, Rita Paroni, and Pietro Allevi 222

NOTES & TIPS

- Prevention of Heteroduplex Formation in mRNA Quantitation by Reverse Transcription–Polymerase Chain Reaction Zhigang Chen, Jason Smithberger, Bing Sun, and Thomas L. Eggerman 230
- Isolation of Multiple Distinct cDNAs by a Single cDNA-Trapping Procedure Maowen Hu and Bingfang Yan 233
- A Positive Selection Cloning System Based on the *gltS* Gene of *Escherichia coli* József Gál, Szilvia Szekeres, Róbert Schnell, Sándor Pongor, András Simoncsits, and Miklós Kálmán 235

BOOK REVIEWS

- Methods in Enzymology, Volume 292, *ABC Transporters: Biochemical, Cellular, and Molecular Aspects.* Edited by Suresh V. Ambudkar and Michael M. Gottesman Reviewed by Jonathan M. Shillingford 239
- Aspartic Proteinases. Retroviral and Cellular Enzymes. Edited by Michael N. G. James Reviewed by Peter McPhie 239

ERRATUM

Volume 264, Number 1 (1998), in Article No. AB982793 "The Maltose-Binding Protein as a Scaffold for Monovalent Display of Peptides Derived from Phage Libraries," by Michael B. Zwick, Lori L. C. Bonnycastle, Karen A. Noren, Sara Venturini, Edward Leong, Carlos F. Barbas, III, Christopher J. Noren, and Jamie K. Scott, pages 87-97 240

Author Index for Volume 266 241

NOTICE

The Subject Index for Volume 266 will appear in the December 15, 1999, issue as part of a cumulative index for the year 1999.

